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EXAMINER	
OLSEN, LIN B	
ART UNIT	**PAPER NUMBER**
3661	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/814,146	KIM, SE-WAN	
	Examiner	Art Unit	
	LIN B. OLSEN	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 08 December 2008.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,2,5,6,8-15,17 and 18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-2,5-6,8-15 & 17-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendments to claims 1, 8, 12-13, 17 and 18 have been entered.

Response to Arguments – Objections and 35 USC 112 2^{nd}

In light of the amendments made, the objections to claims 1, 8, 12, 13 17 and 19 have been withdrawn. Further the rejection of claim 1 under 35 USC § 112 has been withdrawn.

Claim Objections

Claim 9 is objected to because of the following informalities: The claim recites that "the microcomputer compensates a position error of the mobile robot" but there is no previous determination of the position in prior claims from which the position error could be compensated. Perhaps the applicant is referring to the errors accumulated by encoders due to slippage, but such errors have not been recited in the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **1-2, 5-6, 8-15 and 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,758,691 to De Bruyne (De Bruyne) in view of U.S. Patent No. 4,207,571 to Passey (Passey) and U.S. Patent Pub. No. 2004/0158354 to Lee et al. (Lee). De Bruyne teaches an apparatus for determining the position of a movable object. Passey is concerned with navigation aids. Lee is concerned with a robot localization system. Among the references, electrical signals (RF or IR etc) are typically used as a synchronizing signal, and sonic signals are most times used to measure distance, since a sonic sensor is relatively inexpensive. The Examiner takes official notice that all electrical signals travel significantly faster than sonic signals and that the source location of the synchronizing pulse can be chosen between the robot and docking station with only a minor modification in formulas.

Regarding independent **claim 1**, "A method for detecting a position of a mobile robot, the method comprising:" - "a mobile robot" in the preamble, reads on De Bruyne's movable object, because none of the functions of a robot are used or referred to in the body of the claim. It is the fact that both the robot and movable object move that requires that a means be found to determine the object's position. Further Lee is explicitly concerned with a mobile robot.

"calculating time taken for each ultrasonic signal generated by a plurality of ultrasonic signal oscillating units of a charging station to reach the mobile robot, wherein the ultrasonic signals are oscillated sequentially after receiving a radio frequency (RF)

signal emitted at preset times intervals from the mobile robot." - reads on De Bruyne col. 2, lines 64-68 where the method successively measures the traveling times of ultrasonic pulses from two transmitters on a base station to the ultrasound receiver on the moving object. The measurement is carried out on the base station, where a periodic pulse "S" starts the generation of both a counter and one of the ultrasonic transmissions, col. 4, lines 56-63. The process is repeated for the second ultrasound transmitter, having its own counter, col. 4 lines 3-8. The counter(s) are each stopped by the receipt of an infrared pulse generated when the mouse detects the reception of the ultrasonic pulses. The examiner takes official notice that both RF frequencies and visible and invisible light frequencies travel at the same speed and are hence equivalent in this application. The limitation of causing the ultrasonic pulses from the receipt of an RF pulse, does not read on De Bruyne. But the limitation does read on Passey, col.2 lines 27-29, which uses RF signals that are sent at regular intervals to allow measuring the distance at regular times. Further, while Passey uses RF signals, it teaches that one can use IR, UV and visible light in place of RF, Col. 1, lines 18-23. It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute a known RF transmitting/receiving element excited at regular intervals for the infrared transmitting/receiving element transmitting intermittently to obtain the predictable result of a signal transmitted at the speed of light that allows measurement of the distance at any time.

"calculating a distance between the charging station and the mobile robot based on the calculated reaching time; and" - reads on De Bruyne col.3, lines 18-23 where the distances d1 and d2 are determined.

"calculating an angle between the charging station and the mobile robot based on the calculated distance value and a preset distance value between the plurality of ultrasonic signal oscillating units, and" - Reads on De Bruyne col.3, lines 18-42 where the known distance D between the transmitters is used in conjunction with the values d1 and d2 to calculate the x and y coordinates. The angle can be calculated as easily as the coordinates.

"prestoring position numbers for discriminating positions of at least one or more ultrasonic signal reception unit for receiving the ultrasonic signals, among a plurality of ultrasonic signal reception units, in order to detect a direction that the mobile robot proceeds." – This limitation does not read on De Bruyne which utilizes one receiver nor on Passey, which does use a plurality of receivers (2) but does not number the position of the receivers. The limitation does read on Lee, where the first receiving unit 311 of Fig. 1 is composed of multiple sensors (paragraph 11). In Fig. 5 these multiple sensors 311 are illustrated disposed about the circumference of the robot and in Figure 6A and 6B, the sensors are shown numbered from #1 to #n. Further, in paragraph 36, Lee states that "The incident angle calculation unit 313 calculates an incident angle θ of the supersonic wave onto the robot 310 using a difference between receiving times of the supersonic wave in the two or more supersonic sensors provided in the first receiving unit 311." It is necessary to know the identity of the respective sensors to carry out this

calculation. In addition, paragraph 42 details the use of the sensors and that they are number so that sensor #1 can be used as the reference for determining the angle θ. Although the RF transmitter in Lee is situated on the docking station rather than the robot, the travel time for the RF signal is merely ½ the time used in the application. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the known technique of Lee to improve the similar system of De Bruyne/Passey in the same way to provide a more versatile direction determining means.

Regarding **claim 2**, “The method of claim 1, wherein the angle between the charging station and the mobile robot is calculated through triangulation based on the calculated distance value and the preset distance value between the plurality of ultrasonic signal oscillating units.” - Reads on De Bruyne col. 3, lines 18-24, where the distances d1 and d2 to the moving object are determined and the distance D between the two ultrasonic oscillating means is known. The examiner takes official notice that triangulation is a technique well known those in the engineering sciences. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the known technique of triangulation in De Bruyne to determine the angle between the moving object and the base station.

Regarding **claim 5**, “The method of claim 1, further comprising adding a semidiameter of the mobile robot to the distance value between the charging station and the mobile robot.” - does not read on De Bruyne because De Bruyne places the

ultrasonic transducer at the point of measurement. When applicant adds a semidiameter to the distances calculated they are producing a reading from a single point. The application does however, read on Passey which places the ultrasonic receivers outboard of the center of the target. At col. 2, lines 55-57, Passey notes that the range readings calculated based on the ultrasonic receivers displaced from a centerline can be integrated, by well known methods, to produce a single range reading. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the known technique correcting for the displacement of the measurement point to De Bruyne's device if the ultrasonic receiver were on placed atop the target. Further, Lee at paragraph 42, details how "R" in formula 2 is related to the radius of the robot.

Regarding **claim 6**, "The method of claim 1, wherein the distance value between the charging station and the mobile robot is detected through expression S=340[m/sec] x (T1-T2), wherein 340[m/see] is sound velocity, T1 is time taken to receive an ultrasonic signal, and T2 is time taken to oscillate an ultrasonic signal after receiving an RF signal." – This limitation is implied by De Bruyne at col. 3, lines 18-21 where the counters are started at the time the ultrasonic transmitter oscillates and therefore T1-T2 is accomplished. Further, claim 6 reads on Passey where the electromagnetic signal and the sonic signals are transmitted simultaneously, so that T2= 0, col. 1, lines 16-18 and col. 2, lines 14-17. Passey teaches that the conversion of time periods into distance depends on the local speed of sound, col. 3, lines 14-15, which encompasses the

claim's use of 340 m/sec as the speed of sound. Further, Lee uses this equation as equation 1 after paragraph 38.

Regarding independent **claim 8** "An apparatus for detecting a position of a mobile robot, the apparatus comprising:

an RF generating unit installed at a mobile robot and configured to emit an RF (Radio Frequency) signal at preset intervals;" - see discussion of claim 1.

"an RF reception unit installed at a charging station and configured to receive the RF signal emitted by the RF generating unit;" - see discussion at claim 1 and De Bruyne Fig. 1, item 5 in element B.

"a plurality of ultrasonic signal oscillating units each installed at the charging station and for oscillating ultrasonic signals based on a point of time at which the radio frequency signal is emitted; - see discussion at claim 1.

"a control unit configured to control the ultrasonic signal oscillating units so that the ultrasonic signals are oscillated sequentially whenever the RF signal is received by the RF reception unit;" - See discussion at claim 1

"a plurality of ultrasonic signal reception units each installed on an outer circumferential surface of the mobile robot and configured to receive the ultrasonic signals oscillated by the plurality of ultrasonic signal oscillating units; and" - De Bruyne shows only 1 ultrasonic reception unit 6 in Figure 1, but Lee in Fig. 5 shows a number of first receiving units 311 installed on an outer circumference of the mobile robot. In paragraphs 67-78 an alternate use of the configuration of Fig. 5 is discussed using two

transmitters. It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the configuration discussed in Lee to the IR/supersonic transmissions taught by De Bruyne to calculate the distance and angle as illustrated.

“a microcomputer installed in the mobile robot and configured to calculate a distance and an angle between the mobile robot and the charging station based on reaching time taken for each ultrasonic signals to reach the mobile robot and a preset distance value between the plurality of ultrasonic signals oscillating units,” - De Bruyne shows a calculating capability (a computer) at the base station rather than at the mouse. At the time of the reference, a computer would not fit in a device such as a mouse. At col. 8, lines 13-25 various alternative placements of the components of the apparatus are suggested. Placing the computer on the robot is within the simple substitutions that are possible based on this part of the reference. In addition, Lee shows calculating units for distance and angle incorporated in the mobile robot.

Regarding **claim 9**, which depends on claim 8, “wherein the microcomputer compensates a position error of the mobile robot based on the position of the mobile robot estimated from the calculated distance value and angle value.” - It has been shown that De Bruyne allows computation of the position of the movable object- col. 2 line 64 to col. 3 line 42. Therefore, if the microcomputer had a position of the movable device based on another methodology, the position error could be determined by simple arithmetic.

Regarding **claim 10**, which depends on claim 8, “wherein the plurality of ultrasonic signal oscillating units are installed to be symmetric to each other in a horizontal direction of the charging station.” - reads on De Bruyne Fig. 1, elements 1 and 2.

Regarding **claim 11**, which is dependent on claim 8, “wherein the plurality of ultrasonic signal oscillating units are installed to be symmetric to each other in vertical and horizontal directions at the charging station.” - The examiner takes official notice that only the distance between the ultrasonic oscillating means is used in determining the position of the robot. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to place the oscillating means at substitute locations yielding the same positioning information.

Regarding **claim 12**, which depends on claim 8, “wherein the microcomputer detects a reaching time taken for each ultrasonic signal to be received by one or more ultrasonic signal reception units among the plurality of ultrasonic signal reception units after being oscillated by the plurality of ultrasonic signal oscillating units on the basis of a point of time at which the RF signal is generated;

calculates a distance between the mobile robot and the charging station based on the detected reaching time; and

calculates an angle between the mobile robot and the charging station through triangulation based on the detected reaching time and the preset distance value

between the plurality of ultrasonic signal oscillating units." - This claim recites the elements of claim 1 which has been rejected based on De Bruyne/Passey/Lee. De Bruyne uses one ultrasonic signal reception means, Fig 1, element 6. The claim adds the RF signal being generated at present intervals to the limitations of claim 1, which is not taught by De Bruyne but does read on Passey, co1.2 lines 27-29, which uses RF signals that are sent at regular intervals to allow measuring the distance at regular times. Further, Lee teaches using two reception units selected from a plurality to calculate the distance and the angle to the docking station. It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute a known RF transmitting/receiving element excited at regular intervals for the transmitting/receiving element transmitting excited intermittently to obtain the predictable result of a signal traveling at the speed of light that allows measurement of the distance at regular intervals.

Regarding **claim 13**, which is dependent on claim 8, "wherein the microcomputer further comprises a storing unit configured to store position numbers for discriminating positions of the plurality of ultrasonic signal reception units, and detects a direction that the mobile robot proceeds through the stored position number of the ultrasonic signal reception unit which has received the ultrasonic signal among the plurality of ultrasonic signal reception units." – In Lee, Fig. 6A the reception units 311 are shown as numbered at #1, through #n, with the knowledge of receptor number used to determine incident angle of the ultrasonic signal.

Regarding **claim 14**, which is dependent on claim 8, "wherein when the ultrasonic signals are received by two or more ultrasonic reception units among the plurality of ultrasonic signal reception units," – Lee shows in Fig. 5 and 6A, multiple ultrasonic sensors 311 receiving the ultrasonic signals. "microcomputer calculates a reaching time taken for each ultrasonic signal to be received by the two or more ultrasonic signal reception units; selects two ultrasonic signal reception units among the plurality of ultrasonic signal reception units which have received ultrasonic signals whose reaching time is the fastest, among the calculated reaching time values; and calculates a distance between the mobile robot and the charging station based on the reaching time of the ultrasonic signals which have been received by the two selected ultrasonic signal reception units." – Lee Paragraph 41 and 42 describe how the times from the two sensors receiving the ultrasonic signals are used to calculate distance and angle to the docking station using equations 1 and 2. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate this capability in the De Bruyne/Passey combination to use this known technique to improve a similar device and provide a redundant calculation method.

Regarding **claim 15**, which is dependent on claim 8, "wherein the microcomputer detects the distance between the charging station and the mobile robot through expression S=340[m/see] x (T1-T2), wherein 340[m/see] is sound velocity, T1 is time taken to receive an ultrasonic signal, and T2 is time taken to oscillate an ultrasonic

signal after receiving an RF signal." - Reads on Passey where the electromagnetic signal and the sonic signals are transmitted simultaneously, so that T2= 0, col. 1, lines 16-18 and col. 2, lines 14-17. Passey teaches that the conversion of time periods into distance depends on the local speed of sound, col. 3, lines 14-15, which encompasses the claim's use of 340 msec as the speed of sound.

Regarding independent **claim 17**, "An apparatus for detecting a position of a mobile robot, the apparatus comprising:

an RF generating unit installed at a mobile robot and configured to emit an RF(Radio Frequency) signal; " - - see discussion of claim 1 and De Bruyne Fig. l, item 7 in element M.

"an RF reception unit installed at a charging station and configured to receive the RF signal emitted by the RF generating unit;" - see discussion at claim 1 and De Bruyne Fig. 1, item 5 in element B.

"a plurality of ultrasonic signal oscillating units each installed at the charging station and for oscillating ultrasonic signals;" - see discussion at claim 1 and De Bruyne Fig. 1, elements 1 and 2 which are two ultrasonic oscillating units.

"a control unit configured to control the ultrasonic signal oscillating units so that the ultrasonic signals are oscillated sequentially whenever the RF signal is received by the RF reception unit;" - See discussion at claim 1

"a plurality of ultrasonic signal reception units each installed on an outer circumferential surface of the mobile robot and configured to receive the ultrasonic

signals oscillated by the plurality of ultrasonic signal oscillating units; and´" - De Bruyne shows only 1 ultrasonic reception unit 6 in Figure 1, but Lee in Fig. 5 shows a number of first receiving units 311 installed on an outer circumference of the mobile robot. In paragraphs 67-78 an alternate use of the configuration of Fig. 5 is discussed using two transmitters. It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the configuration discussed in Lee to the IR/supersonic transmissions taught by De Bruyne to calculate the distance and angle as illustrated.

"a microcomputer installed in the mobile robot and configured to calculate a distance and an angle between the mobile robot and the charging station based on reaching time taken for each ultrasonic signal to reach the mobile robot and a preset distance value between the plurality of ultrasonic signals oscillating units," – De Bruyne shows a calculating capability (a computer) at the base station rather than at the mouse. At the time of the reference, a computer would not fit in a device such as a mouse. At col. 8, lines 13-25 various alternative placements of the components of the apparatus are suggested. Placing the computer on the robot is within the simple substitutions that are possible based on this part of the reference. In addition, Lee shows calculating units for distance and angle incorporated in the mobile robot.

"wherein the microcomputer further comprises a storing unit configured to store position numbers for discriminating positions of the plurality of ultrasonic signal reception units, and detects a direction that the mobile robot proceeds through the stored position number of the ultrasonic signal reception unit which has received the ultrasonic signal first among the plurality of ultrasonic signal reception units." – In Lee,

Fig. 6A the reception units 311 are shown as numbered at #1, through #n, with the knowledge of receptor number used to determine incident angle of the ultrasonic signal.

Regarding independent **claim 18**, “An apparatus for detecting a position of a mobile robot, the apparatus comprising:

an RF generating unit installed at a mobile robot and configured to emit an RF (Radio Frequency) signal;” - see discussion of claim 1 and De Bruyne Fig. l, item 7 in element M.

“an RF reception unit installed at a charging station and configured to receive the RF signal emitted by file RF generating unit; “ - - see discussion at claim 1 and De Bruyne Fig. 1, item 5 in element B.

“a plurality of ultrasonic signal oscillating units each installed at the charging station and for oscillating ultrasonic signals;” - see discussion at claim 1 and De Bruyne Fig. 1, elements 1 and 2 which are two ultrasonic oscillating units.

“a control unit configured to control the ultrasonic signal oscillating units so that the ultrasonic signals are oscillated sequentially whenever the RF signal is received by the RF reception unit;” - See discussion at claim 1

“a plurality of ultrasonic signal reception units each installed on an outer circumferential surface of the mobile robot and configured to receive the ultrasonic signals oscillated by the plurality of ultrasonic signal oscillating units; and” ” - De Bruyne shows only 1 ultrasonic reception unit 6 in Figure 1, but Lee in Fig. 5 shows a number of first receiving units 311 installed on an outer circumference of the mobile robot. In

paragraphs 67-78 an alternate use of the configuration of Fig. 5 is discussed using two transmitters. It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the configuration discussed in Lee to the IR/supersonic transmissions taught by De Bruyne to calculate the distance and angle as illustrated.

“a microcomputer installed in the mobile robot and configured to calculate a distance and an angle between the mobile robot and the charging station based on reaching time taken for each ultrasonic signal to reach the mobile robot and a preset distance value between the plurality of ultrasonic signals oscillating units,” - De Bruyne shows a calculating capability (a computer) at the base station rather than at the mouse. At the time of the reference, a computer would not fit in a device such as a mouse. At col. 8, lines 13-25 various alternative placements of the components of the apparatus are suggested. Placing the computer on the robot is within the simple substitutions that are possible based on this part of the reference. In addition, Lee shows calculating units for distance and angle incorporated in the mobile robot.

“wherein when the ultrasonic signals are received by two or more ultrasonic signal reception units among the plurality of ultrasonic signal reception units, the microcomputer calculates reaching time taken for each ultrasonic signal to be received by the two or more ultrasonic signal reception units; selects two ultrasonic signal reception units which have received ultrasonic signals whose reaching time is the fastest, among the calculated reaching time values; and calculates a distance between the mobile robot and the charging station based on the reaching time of the ultrasonic signals which have been received by the two selected ultrasonic signal reception units.”

– Lee shows in Fig. 5 and 6A, multiple ultrasonic sensors 311 receiving the ultrasonic signals. .” – Lee Paragraph 41 and 42 describe how the times from the two sensors receiving the ultrasonic signals are used to calculate distance and angle to the docking station using equations 1 and 2. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate this capability in the De Bruyne/Passey combination to use this known technique to improve a similar device and provide a redundant calculation method.

Response to Arguments

Applicant's arguments filed December 5, 2008 have been fully considered but they are not persuasive. Applicants amendments to the claims addressed the 35 USC 112 2nd objections but did not overcome the art rejections. Lee does teach prenumbering the ultrasonic receptors around the periphery of the robot as shown in Lee Fig. 6A and 6B, and detailed as addressed in the rejection of Claim 1. At the onset of the action, the Examiner took Official Notice that it is well known that Light and/or RF signals travel so much faster than sonic waves, that the location of a source for such signals is a matter of choice for the designer, when the measurement depends on the travel time of the sonic wave. The Examiner has now pointed to those sections of De Bruyne that detail the sequential nature of the ultrasonic transmissions.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin B Olsen/
Examiner, Art Unit 3661

/Thomas G. Black/
Supervisory Patent Examiner, Art Unit 3661